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IN THE

Supreme Court of the United States

OCTOBER TERM, 1961

No. 597

RUBBER CORPORATION OF CALIFORNIA,

Petitioner,

vs.

NATIONAL SPONGE CUSHION CO., INC.,

Respondent.

Petition for a Writ of Certiorari to the United States Circuit Court of Appeals for the Ninth Circuit.

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SUBJECT INDEX

PAGE

Opinions below 1

Jurisdiction 2

Questions presented for review 2

Federal Rules of Civil Procedure are involved 3

Concise statement of the case 6

Argument 8

Conclusion 17

Appendix:

Opinion of the United States Court of Appeals for the Ninth Circuit ..... App. p. 1

Judgment ..... App. p. 13

Memorandum opinion 14

Patent No. 2,740,739, issued April 3, 1956, "Carpet Underlay" ..... App. p. 15

Patent No. 2,740,739. Patent admits prior types of carpet underlay ..... App. p. 16

Patent No. 2,480,316 issued August 30, 1949, "Method of Making Laminated Cushion Material" ..... App. p. 18

Patent No. 2,480,316. Prior art patent ..... App. p. 19

TABLE OF AUTHORITIES CITED

CASES — PAGE

Federal Deposit Insurance Corp. v. Alker, 223 F. 2d 262 16

Klapprott v. United States, 335 U. S. 601, 69 S. Ct. 384, 93 L. Ed. 266 15

Kohn v. Eimer, 265 Fed. 900 14

Russell v. Cunningham, 279 F. 2d 797 15

Serio v. Badger Mutual Insurance Company, 266 F. 2d 418 15

Sternstein v. "Itallia"-Societa per Azioni di Navigazione-Genoa, 275 F. 2d 502 14

RULES

Federal Rules of Civil Procedure, Rule 59 ..... 2, 3, 6, 13, 16, 17

Federal Rules of Civil Procedure, Rule 60 ..... 2, 6, 13

Federal Rules of Civil Procedure, Rule 60(b) 15, 16, 17

Federal Rules of Civil Procedure, Rule 60(b)(6) 2, 3, 6, 13, 15, 16, 17

STATUTES

United States Code, Title 28, Sec. 1254(1) 2

United States Code, Title 28, Sec. 1338(a) 8

United States Code, Title 35, Sec. 281 8

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To the Honorable Chief Justice and the Associate Justices of the Supreme Court of the United States:

Petitioner prays that a writ of certiorari issue to review the judgment of the United States Circuit Court of Appeals for the Ninth Circuit entered February 8, 1961 (App. p. 1).

Opinions Below.

The memorandum opinion of the trial court will be found at R. Vol 1, p. 34. The opinion of the Circuit Court of Appeals is set forth in the appendix at page 1. It is reported at 286 F. 2d 731.

Jurisdiction.

The judgment of the Circuit Court of Appeals was entered February 8, 1961 (App. p. 1). A petition for rehearing was seasonably filed and denied on March 21, 1961 (App. p. 13). A motion for permission for the District Court to decide on its merits defendant's motion for new trial under Rules 59 and 60 F. R. C. P. was seasonably filed and denied by the Circuit Court of Appeals on September 12, 1961 (App. p. 14).

Jurisdiction of this Court is invoked under Title 28 U. S. C., Sec. 1254(1). The suit arises under the patent laws for patent infringement.

Questions Presented for Review.

(1) Can a Circuit Court of Appeals properly place its own interpretation on what it believes to be inherent in the disclosure of a prior art patent where such interpretation is contrary to such disclosure, and at the same time, refuse defendant an opportunity, under Rules 59 and 60(b)(6), F. R. C. P., to submit physical evidence that the interpretation of the Circuit Court of Appeals is erroneous, as proven by actual practice of the teachings of the prior patent?

(2) Should the benefits of Rules 59 and 60(b)(6) be denied a defendant, who requests a hearing on the merits to prove invalidity of a patent on physical evidence, to rebut plaintiff's unsupported *ex parte* claims after trial and the parallel theory of the Circuit Court of Appeals that plaintiff's patentee's own prior art patent teachings are erroneous and could not result in the product of the patent in suit?

Federal Rules of Civil Procedure Are Involved.

The rules involved in this case are Rule 59 F. R. C. P. and Rule 60(b)(6), the full text of each rule being set forth as follows:

"RULE 59. NEW TRIALS; AMENDMENT OF JUDGMENTS

Text of Rule

"(a) Grounds. A new trial may be granted to all or any of the parties and on all or part of the issues (1) in an action in which there has been a trial by jury, for any of the reasons for which new trials have heretofore been granted in actions at law in the courts of the United States; and (2) in an action tried without a jury, for any of the reasons for which rehearings have heretofore been granted in suits in equity in the courts of the United States. On a motion for a new trial in an action tried without a jury, the court may open the judgment if one has been entered, take additional testimony, amend findings of fact and conclusions of law or make new findings and conclusions, and direct the entry of a new judgment.

"(b) Time for Motion. A motion for a new trial shall be served not later than 10 days after the entry of the judgment.

"(c) Time for Serving Affidavits. When a motion for new trial is based upon affidavits they shall be served with the motion. The opposing party has 10 days after such service within which to serve opposing affidavits, which period may be extended for an additional period not exceeding 20 days either by the court for good cause shown

or by the parties by written stipulation. The court may permit reply affidavits.

"(d) On Initiative of Court. Not later than 10 days after entry of judgment the court of its own initiative may order a new trial for any reason for which it might have granted a new trial on motion of a party, and in the order shall specify the grounds therefor.

"(e) Motion to Alter or Amend a Judgment. A motion to alter or amend the judgment shall be served not later than 10 days after entry of the judgment. As amended Dec. 27, 1946 eff. March 19, 1948."

"RULE 60. RELIEF FROM JUDGMENT OR ORDER

Text of Rule

"(a) Clerical Mistakes. Clerical mistakes in judgments, orders or other parts of the record and errors therein arising from oversight or omission may be corrected by the court at any time of its own initiative or on the motion of any party and after such notice, if any, as the court orders. During the pendency of an appeal, such mistakes may be so corrected before the appeal is docketed in the appellate court, and thereafter while the appeal is pending may be so corrected with leave of the appellate court.

"(b) Mistakes; Inadvertence; Excusable Neglect; Newly Discovered Evidence; Fraud, Etc. On Motion and upon such terms as are just, the court may relieve a party or his legal representative from

a final judgment, order, or proceeding for the following reasons: (1) mistake, inadvertence, surprise, or excusable neglect; (2) newly discovered evidence which by due diligence could not have been discovered in time to move for a new trial under Rule 59(b); (3) fraud (whether heretofore denominated intrinsic or extrinsic), misrepresentation, or other misconduct of an adverse party; (4) the judgment is void; (5) the judgment has been satisfied, released, or discharged, or a prior judgment upon which it is based has been reversed or otherwise vacated, or it is no longer equitable that the judgment should have prospective application; or (6) any other reason justifying relief from the operation of the judgment. The motion shall be made within a reasonable time, and for reasons (1), (2), and (3) not more than one year after the judgment, order, or proceeding was entered or taken. A motion under this subdivision (b) does not affect the finality of a judgment or suspend its operation. This rule does not limit the power of a court to entertain an independent action to relieve a party from a judgment, order, or proceeding, or to grant relief to a defendant not actually personally notified as provided in Title 28, U.S.C. §1655, or to set aside a judgment for fraud upon the court. Writs of coram nobis, coram vobis, audita querela, and bills of review and bills in the nature of a bill of review, are abolished, and the procedure for obtaining any relief from a judgment shall be by motion as prescribed in these rules or by an independent action. As amended Dec. 27, 1946, eff. March 19, 1948; Dec. 29, 1948, eff. Oct. 20, 1949."

Concise Statement of the Case.

This is a patent infringement suit for money damages. It was tried to a jury and the patent held valid and infringed. The District Court granted defendant's motion for judgment notwithstanding the verdict on the basis of the disclosure in a prior art patent and the District Court Judge found the patent invalid for anticipation. Plaintiff's petition to the District Court for rehearing was denied, the petition having been accompanied by affidavits of plaintiff's patentee-employee, who was also a patentee of the prior patent principally relied upon in the decision of invalidity.

The Ninth Circuit Court of Appeals reversed the judgment of the trial court and found the patent valid and infringed, basing its decision on a theory of the inherent result of the prior art teaching which was parallel to the theories presented after judgment in plaintiff's said affidavits. These theories were inconsistent with the teachings of the prior patent.

Defendant's petition for rehearing to the Circuit Court of Appeals was denied without comment (App. p. 13). Defendant's motion to the trial court for new trial under Rules 59 and 60 was denied without ruling on the merits on the ground that the trial court was powerless to act on the merits in view of the decision of the Circuit Court of Appeals. Defendant then unsuccessfully (App. p. 14) moved the Circuit Court of Appeals to grant permission to have the trial court consider on its merits, a motion under Rules 59 and 60(b)(6), F. R. C. P., physical evidence upholding what the trial court found to be the inherent result of the prior art patent teaching, and disproving the theories

presented by plaintiff's *ex parte* affidavits after trial and judgment and the theory of the Circuit Court of Appeals.

Plaintiff opposed the motion on the technical grounds that defendant should have presented earlier the physical evidence of the invalidity of the patent in suit, despite the fact that the issue requiring it was not raised by plaintiff at trial and there had been no earlier need for it.

It is defendant's contention that the unsubstantiated, self-serving *ex parte* affidavits of plaintiff after trial and judgment, which were rejected by the trial court in denying plaintiff's motion for rehearing, influenced the Circuit Court of Appeals in its decision, since plaintiff did not question the prior art patent disclosure at trial. Plaintiffs at trial, presented no evidence supporting plaintiff's late and incompetent criticism of the prior art patent or supplying a basis for the theory of the Circuit Court of Appeals as to the alleged inherent result of the practice of the teachings of the prior art patent.

Since plaintiff strongly relied upon the theories first presented in its post-trial affidavits when the trial court's judgment was appealed, the Circuit Court of Appeals erred, after adopting a theory similar to that of plaintiff's affidavits, in denying to defendant its day in court with the right to be heard on the merits, upon a strong showing, that defendant's physical evidence would prove the correctness of the prior art teaching and its inherent result and thereby invalidate the patent in suit.

Argument.

This case is a suit for patent infringement for damages under the patent laws of the United States and more particularly Title 35, U. S. C., Section 281, and the United States District Court, Southern District of California had jurisdiction under Title 28, U. S. C. Section 1338(a).

The patent in suit, No. 2,740,739, issued April 3, 1956 to Harwin, Stern and Bodle for "Carpet Underlay" (App. p. 15). The patented product is used as a cushion beneath carpeting to provide resiliency and comfort to the step.

It comprises a blown sponge rubber mat having hollow bulges, and secured to an open-mesh fabric, the latter serving to prevent excessive lateral spreading of the hollow bulged sponge under weight.

The patent admits that prior types of carpet underlay include jute pads with or without rubber sprayed thereon, flat sponge rubber pads with or without fabric, flat latex sponge rubber, waffle-type sponge rubber with pre-cemented fabric on one side, and embossed rubber sheets in which resiliency is imparted by the embossments (App. p. 16, Col. 1, lines 20-26).

It is defendant's contention that the primary prior art patent No. 2,480,316 (App. p. 18), issued August 30, 1949 over three years prior to December 27, 1952, the date of the application for the patent in suit, and having as a co-patentee, Virgil H. Bodle, a co-patentee of the patent in suit, if practiced as taught, will inherently result in the production of the product of the patent in suit. The common patentee of the two patents in question has done no more than take the teach-

ings of his prior patent on a process for making carpet underlay and, more than two years later, set forth the teachings of his prior patent in different language including the term "key-lock," an inherent and inescapable result of his own prior art teaching, and claim the product thereof. In the prior art patent the product is disclosed but not claimed.

The jury on June 11, 1958 held the patent in suit valid and infringed [R. Vol. 1, pp. 30, 31]. Defendant's motion for judgment notwithstanding the verdict [R. Vol. 1, p. 32] was upheld by the trial judge and the patent found invalid in a memorandum of decision filed March 31, 1959 [R. Vol. 1, pp. 34-37]. Findings of Fact, Conclusions of Law and Judgment holding the patent invalid were approved by the court and filed April 13, 1959 [R. Vol. 1, pp. 38-45].

A petition for reconsideration of the judgment of the court was filed by plaintiff April 24, 1959 [R. Vol. 1, pp. 46, 47]. This petition was accompanied by the affidavit of said Bodle, a patentee of the patent in suit and of the prior art patent, and an employee of plaintiff [R. Vol. 1, pp. 47-53]. Plaintiff filed a supplemental affidavit by Bodle on May 7, 1959 [R. Vol. 1, pp. 53-55]. These affidavits were unsuccessful in supporting plaintiff's petition. They comprise the first challenge by plaintiff of the clear teachings of the prior art patent and its pertinency as an anticipation of the patent in suit. Plaintiff's petition for reconsideration was denied May 12, 1959 [R. Vol. 1, p. 55]. Upon appeal by plaintiff, the Circuit Court of Appeals reversed the trial judge and found the patent valid and infringed (App. p. 12).

In disagreeing with defendant's contention that by following the teaching of the prior art patent the blowable sponge rubber would inescapably project into and through the open-mesh fabric, thereafter widening and forming the key-lock of plaintiff's claims, the Court of Appeals, on page 4 of its Decision (App. p. 3), stated:

> "On the contrary, the patent (the prior art patent) suggests quite the opposite. It states that the heated rubber 'is soft enough so that it will gravitate into the channels of the shaping drum.' It suggests that a suction pull may be added to that of gravity. The quoted description refers to a pull by gravity or suction precisely opposite to that which is described in plaintiff's patent. This gravitating into the channels of the shaping drum is a process to form the waffle-like ridges or projections, the push or pull being away from and not toward the fabric." (Parenthetical wording supplied.)

Plaintiff's affidavit of Bodle [R. Vol. 1, pp. 47, 48] states:

> "Sponge rubber, if heated by the drum 16 sufficiently to cause it to blow, would be so nearly fluid that the vacuum would suck the almost fluid sponge rubber through the holes 21 into the hollow interior of the drum 16 in the form of rubber threads and such suction or vacuum would certainly break the thin sheet of almost fluid sponge rubber in the channels 23."

Then on the next page [Vol. 1, p. 49], the same affidavit states:

> "What would cause the nearly fluent sponge rubber to fall away from the upper half of the channels 23 as the drum rotates? Gravity."

Other than plaintiff's patentee's affidavit statements, there is nothing in the record of the case to provide a foundation for the theories adopted by the Circuit Court of Appeals.

Plaintiff's affidavits by Bodle [R. Vol. 1, pp. 47 and 53 respectively], beside lacking probative qualifications because of their very nature, are subject to question because the affiant belies the teachings of his own prior patent throughout the affidavits. Some of the statements therein are mere predictions as to what would occur if the prior patent were followed, contrary to what appears on the face of the patent. Even more, Bodle in Vol. 1 of the record, page 50, denies what he swore was part of his invention when he filed his earlier patent application. He states:

> "While it is true that the undersigned executed the application for patent '316, the suggestion of the sponge rubber did not come from either of the inventors named in patent '316; it came from the patent attorney who prepared it."

The prior art patent states:

> ". . . blowable cellular or sponge rubber may be used. . . ." (App. p. 19, Col. 1, lines 39, 40.)

Not only does the prior patent specifically and unmistakably disclose that blowable cellular or sponge rubber may be used but it qualifies the illustration of the product in Figure 1 of the drawings by teaching that cement is not needed to join the rubber and the burlap or open mesh fabric. It states:

> "The backing sheet 12 touches and is secured to the peaks or tops of the embossments or corrugations at one side of the rubber sheet as by a

layer or coating 13 of cement, rubber or the like, *or by being vulcanized directly thereto.*" (App. p. 19, Col. 2, lines 21-26) (emphasis supplied).

With respect to the hollow bulges of the patent in suit and the use of the fabric therein to prevent spreading of the hollow bulged sponge rubber, the prior patent states:

"This backing sheet bridges and closes the open sides of the embossments at one side of the rubber sheet and thereby prevents collapse of the hollow embossments which have their open sides closed by the backing sheet 12." (App. p. 19, Col. 2, lines 26-32.)

Further in the disclosure in the prior patent vulcanization is referred to as follows:

"If desired, the hollow shaping drum may also be heated, in any suitable manner, not shown, but preferably by the injection of steam into the interior chamber 22 of the drum, so as to vulcanize the rubber sheet during the shaping thereof and while the backing sheet is being applied thereto." (App. p. 20, Col. 3, lines 60-66).

* * * * *

"Other ways of heating the drum may be employed for softening the rubber so that it may readily conform to the corrugated periphery of the drum, *and for vulcanization purposes where vulcanization is desired* when the rubber sheet is on the drum." (App. p. 20, Col. 4, lines 1-6.) (Emphasis supplied.)

The patent teaches the use of open-mesh fabric. It states:

> "The flexible backing sheet 12 of suitable textile or other strong and durable preferably *open material*, such as burlap, Osnaburg, or the like, is led from a source of supply 29, between the portions of the rubber sheet 10 and the belt 18, which partially embrace the drum 16, so that the burlap will be carried along with the rubber sheet or strip in contact with the outer closed sides of the ribs 11 of the rubber sheet until the corrugated rubber sheet and the backing sheet thereon are discharged from the apparatus at the point where the guide roller 19' leads the endless belt 18 away from the drum." (App. p. 20, Col. 4, lines 33-45.) (Emphasis supplied.)

The Circuit Court of Appeals has denied to defendant the right to present its motion under Rules 59 and 60 F.R.C.P., and more particularly, Rule 60(b) (6) to the District Court for a new trial to weigh evidence comprising a physical embodiment of the apparatus disclosed in Figure 2 of the prior patent and carpet underlay manufactured in said apparatus by using open-mesh fabric and blowable sponge rubber, wherein the sponge when heated in said apparatus is projected into and through the interstices of the fabric and results in a key-lock and the product of the patent in suit.

Certainly, the actual product resulting from the practice of the prior art patent teachings is more convincing of the inherent result of such prior art patent teaching than the unsupported theories of plaintiff's affiant and of the Circuit Court of Appeals.

The effect of the denial of plaintiff's right to rebut unsupported theories advanced after trial is to create a monopoly on that which previously had been dedicated to the public.

Even if the patentee common to the patent in suit and the prior art patent be acknowledged as an expert in the field, it was not his testimony at trial as an expert upon which plaintiff relies, but upon the unsubstantiated affidavits of that patentee in making a showing rejected by the district court on a motion for reconsideration of the judgment of that court. The Circuit Court of Appeals therefore had no proper expert testimony upon which to rely in its theory conflicting with the clear disclosure of the prior patent.

As the late respected Justice Learned Hand stated in *Kohn v. Eimer*, 265 Fed. 900, 902 in discussing the function of a patent expert,

> "Specifications are written to those skilled in the art, among whom judges are not."

It is respectfully submitted that this is a case where defendant properly should have been given an opportunity to be heard on the merits of its motion. The Second Circuit Court of Appeals in *Sternstein v. "Italia"-Societa per Azioni di Navigazione-Genoa*, 275 F. 2d 502 held:

> "It is clear that a motion for a new trial under Rule 60(b) may be made 'within a reasonable time,' and the delay here was no more than a few days. The trial judge believed the interests of justice required a new trial and the record discloses that there was a proper basis for such belief."

The Ninth Circuit Court of Appeals in *Russell v. Cunningham*, 279 F. 2d 797, held that an order denying a motion under Rule 60(b) is appealable and further held:

> "In addition, there are many cases where appeals from denial of relief under 60(b) have been considered and passed upon without discussing the appealability of the order. The Supreme Court has done so. Ackerman v. United States, 340 U. S. 193 (1950); see Klapprott v. United States, 335 U. S. 601 (1949)."

In *Klapprott v. United States*, 335 U. S. 601, 614, 69 S. Ct. 384, 390, 93 L. Ed. 266, in discussing Rule 60(b)(6) Mr. Justice Black stated:

> "In simple English, the language of the 'other reason' clause, for all reasons except the five particularly specified, vests power in courts adequate to enable them to vacate judgments whenever such action is proper to accomplish justice."

Also in *Klapprott v. United States*, the leading case concerning Rule 60(b)(6), this Honorable Court stated:

> "To accept this contention would therefore introduce needless confusion in the administration of 60(b) and would also circumscribe it within needless and uncertain boundaries. Furthermore 60(b) strongly indicates on its face that courts no longer are to be hemmed in by the uncertain boundaries of these and other common law remedial tools."

The Fifth Circuit Court of Appeals in *Serio v. Badger Mutual Insurance Company*, 266 F. 2d 418,

421 found a delay of nearly seven months after judgment was not an unreasonable time within which to file a motion under Rule 60(b) and stated:

> "The rule is to be liberally construed in order that judgments may reflect the true merits of a case."

Defendant is not requesting this Honorable Court to decide the merits of defendant's motion under Rules 59 and 60(b)(6) F.R.C.P. It is only petitioning for a decision as to whether the trial court should have the opportunity which the Circuit Court of Appeals has denied, to pass upon the merits of defendant's motion.

The Third Circuit Court of Appeals in *Federal Deposit Insurance Corp. v. Alker,* 223 F. 2d 262, 263 stated:

> "The judgment of the district court in this case was affirmed by this court on November 7, 1945, 151 F. 2d 907. Since that time defendant Alker has made repeated efforts in the district court, in this court and in the Supreme Court to obtain relief from the judgment by way of a new trial. This court is now again presented by Alker with a motion for an order granting leave to the district court to reconsider his motion for a new trial. We are constrained at this time to grant the leave requested even though we have denied similar applications in the past. We do so because we have now reached the conclusion that Alker should have an opportunity to convince the district court, if he can, that he is entitled under Rule 60(b) of the Federal Rules of Civil Procedure, 28 U. S. C.

to relief from the judgment entered against him by that court. *In reaching this conclusion we make it clear that we intimate no opinion upon the merits of Alker's motion for a new trial or even whether the district court is empowered to grant it under Rule 60(b). We merely desire to open the way for the district court to decide those questions, which it will do in the exercise of its own responsibility and discretion.* We will, of course, also vacate the writs of prohibition and mandamus heretofore directed to the district court at our No. 10,948, 206 F. 2d 299)." (Emphasis supplied.)

Conclusion.

(1) The Circuit Court of Appeals erred in adopting an interpretation as to what was inherent in the disclosure of the prior art patent contrary to the express terms of such disclosure, and on the basis of such interpretation, refusing defendant an opportunity under Rules 59 and 60(b)(6) F.R.C.P. to submit evidence that such interpretation is erroneous, based upon actual practice of the teachings of the prior patent.

(2) The Circuit Court of Appeals erred in denying the benefits of Rule 59 and or 60(b)(6) F.R.C.P. to defendant who requested a hearing on the merits to prove invalidity of the patent in suit on physical evidence rebutting plaintiff's unsupported ex parte claims after trial, and also rebutting the theory of the Circuit Court of Appeals parallel to that of plaintiff's claims to the effect that plaintiff's patentee's own prior art

patent teachings are erroneous and could not result in the product of the patent in suit.

You are accordingly respectfully petitioned to issue a Writ of Certiorari as the questions involved herein are of importance not only to this petitioner but to the public and should be determined by this Court.

Respectfully submitted,

ALLAN D. MOCKABEE,
Attorney for Petitioner.

APPENDIX.

Opinion of the United States Court of Appeals for the Ninth Circuit.

United States Court of Appeals for the Ninth Circuit.

National Sponge Cushion Co., Inc., a corporation, Appellant, vs. Rubber Corporation of California, Appellee. No. 16,562.

Filed Feb. 8, 1961.

Appeal from the United States District Court for the Southern District of California, Central Division.

Before Stephens, Pope and Jertberg, Circuit Judges.

Pope, Circuit Judge.

The appellant, owner of Harwin Patent No. 2,740,737, for Carpet Underlay, brought this action against the appellee charging infringement of its patent and seeking damages therefor. After issued joined, the case was tried to a jury which returned a verdict for the plaintiff. Thereafter the court granted defendant's motion for judgment notwithstanding the verdict under Rule 50(b) of Federal Rules of Civil Procedure, and entered judgment accordingly for the defendant.

The action of the court was based upon the findings of the trial judge that the claimed patent lacked novelty because of anticipation of its claims by developments in the prior art. By this appeal the plaintiff challenges the propriety of the court's rejection of the contrary finding of the jury and its own finding of anticipation.

Plaintiff's patent relates to a type of product which is used to underlay, anchor and cushion floor carpets. In this general area of product, such carpet underlays are useful in cushioning the carpet and making it more

resilient. For this reason the main constituent of the underlay is made of rubber, usually foam rubber, because of its cushioning effect. The rubber serves to anchor the carpet and prevent slipping along the floor.

Such devices are usually completed by attaching to the upper surface of the rubber pad which lies next to the floor a fabric material sealed or bonded in some manner to the rubber pad. Prior to plaintiff's product, this was done by using a cement to join the fabric to the rubber. This fabric serves two purposes: It furnishes a fairly flat surface on which the carpet may lie and it holds firmly in place the rubber pad to which it is affixed preventing it from spreading by lengthening or widening as a result of use, as it might otherwise do. Some of these carpet underlays are made of foam rubber formed in corrugations so as to facilitate air reaching all parts of the pad and thus aiding in retention of its resiliency. When the rubber pad is formed in that manner the anti-spreading action of the attached fabric is particularly useful as a corrugated rubber pad is more likely to spread apart than would be the case with a solid rubber one.

Plaintiff's claimed invention, as the stated claims disclose, relates solely to the manner in which the fabric portion of the underlay is attached and fastened to the rubber which lies beneath it. The patented structure discloses that the coarse fabric, with interstices approximately one-sixteenth of an inch square, has been bonded to the rubber through the fact that the rubber has been caused to penetrate the interstices of the fabric so that after passing through such openings the penetrated rubber has spread out and formed protrusions with knob-like heads larger than the interstices. The result

is a key-locked connection between the fabrics and the sponge rubber which has been accomplished without the use of any adhesive.

In further explanation of the structure, the specifications state that this key-locking mode of attachment of the fabric to the rubber pad with its waffle-like corrugations is accomplished by heating and blowing the sheet of sponge rubber into a corrugated mold whereby the rubber is held in intimate contact with the fabric so that in blowing or expanding, the rubber is forced to enter the interstices of the fabric and swell around adjacent threads of the fabric and form the headed knob-like projections that are somewhat larger in size than the areas of the fabric interstices. The claims as stated appear in the margin.[1]

In this case, as in many other cases where a claimed invention is attacked on the ground that the claims of patented devices were anticipated by earlier patents, the

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[1] "1. A carpet underlay comprising a coarse-mesh fabric, and a sponge rubber facing on one side of said fabric and formed with bulges that are spaced from the fabric, said facing between the bulges, being in contact with the fabric and having a multiplicity of projections formed and forced by pressure from a blowing agent and extending into and through the interstices of the fabric.

"2. A carpet underlay according to claim 1: the portions of said projections that extend through the interstices of the fabric being larger than said interstices to effect a key-locking engagement of the fabric and the sponge rubber.

"3. A carpet underlay comprising a coarse-mesh fabric, a sponge rubber facing on one side of said fabric and formed with bulges that are spaced from the fabric, said facing, between the bulges, being in contact with the fabric, a multiplicity of integral projections on the bulges and extending through the interstices of the fabric to bond the bulges of the facing and the fabric, the latter being generally flat.

"4. In a carpet underlay according to claim 3: the projections being disposed along space parallel lines that are on a bias relative to the weave of the fabric."

decision as to validity may turn upon a question of fact. Leishman v. General Motors Corp., 9 Cir., 191 F. 2d 522, 529. (See other cases cited in Bergman v. Aluminum Lock Shingle Corp. of America, 251 F. 2d 801, 809-813, concurring opinion.) Our first inquiry necessarily is: what was the prior art as disclosed by the prior patents which were part of the record in this case? The question is whether insofar as this factor entered into the verdict of the jury, the evidence of anticipation was so overwhelming and compelling that it can be said that as a matter of law there was a total failure of proof of the essential novelty to sustain the plaintiff's case so that the district court was justified in granting judgment notwithstanding the verdict.

The Judge's conclusion, as disclosed by his memorandum of decision, was based upon his views of two prior patents, Blair and Bodle, No. 2,480,316, and Coyte, No. 562,281. This he stated in the memorandum as follows: "The Patent in suit does not disclose invention in the light of the teaching of Blair and Bodle United States Letters Patent No. 2,480,316, particularly in view of Coyte, United States Letters Patent No. 562,281." So far as those two patents are concerned, we have no difficulty in arriving at a conclusion that neither one of them was of such character as to establish anticipation. As we have said, the novelty claimed for the patent here in suit relates to the manner of key-locking or bonding the woven fabric to the rubber pad; the Blair and Bodle patent was a process patent stated to be for a method of making laminated cushion material. That patent described a product made of a sheet or lamination of rubber which might be shaped or formed into corrugations or hollow ribs

which had applied to it a backing sheet of material such as burlap to reinforce the rubber material. However, the method of attachment of the backing sheet is there described as follows: "The backing sheet 12 touches and is secured to the peaks or tops of the embossments or corrugations at one side of the rubber sheet as by a layer or coating 13 of cement, rubber or the like, or by being vulcanized directly thereto."[2]

Another prior patent relied on by the trial court as an anticipation has even less resemblance to the claimed patentable feature of the patent here in suit. Claims 1 and 2 of the plaintiff's patent described a project which has rubber "formed and forced by pressure from a blowing agent and extending *into and through* the interstices of the fabric." (Emphasis added.) The portions of the projections that extend through the interstices of the fabric are described as "being larger than said interstices to effect a keylocking engagement of the fabric and sponge rubber." Coyte contains nothing which remotely resembles this.

The Coyte process if for the purpose of making gutta-percha cloth. The process involves the passing

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[2]Appellee suggests that since this patent contemplated the use of blowable cellular or sponge rubber, that the blowable sponge rubber would project into and through the open mesh fabric thereafter widening and forming the key-lock referred to in plaintiff's claims. There is no evidence to support such a contention, and nothing in the Blair-Bodle patent to suggest that any such thing was contemplated. On the contrary, the patent suggests quite the opposite. It states that the heated rubber "is soft enough so that it will gravitate into the channels of the shaping drum." It suggests that a suction pull may be added to that of gravity. The quoted description refers to a pull by gravity or suction precisely opposite to that which is described in plaintiff's patent. This gravitating into the channels of the shaping drum is a process to form the waffle-like ridges or projections, the push or pull being away from and not toward the fabric.

of a sheet of gutta-percha with a cloth or fabric laid upon it between heated rolls, firmly pressed together, so that portions of the gutta-percha sheet will "project into the meshes of the fabric" and "cause the gutta-percha to be held to the fabric."

It would appear to be obvious that this proces. could not possibly cause the gutta-percha to extend "through" the interstices of the fabric or to accomplish an attachment by a key-locking process.

If all that this record contained with respect to anticipation of the patent in suit were the two patents we have just discussed, namely, Blair and Bodle, and Coyte, it would be hard to say that there was sufficient evidence even to permit a submission of that question to a jury. With that alone in the record it could well be said that no valid challenge of the novelty of plaintiff's device had been presented. But there is in the record another patent not alluded to by the court in its findings or opinion which in our view does present a question of fact with respect to anticipation, although a question which we think it was proper for the jury to decide.

That patent is Alderfer No. 2,048,619. It discloses an undertaking by the inventor to produce a very different product having very different qualities than that contemplated by the patent in suit. That patent was for what was called a "fabric coated sponge rubber and method of making same." The indicated objectives related solely to the procuring of desirable surfaces both on the rubber and on the fabric. The patent undertook to disclose a novel product where the "outer surface of the foam rubber is smooth, planished and porous having uniformly distributed microscopic pores."

For the fabric side of the product the object was to see to it that "the fabric be a knitted textile fabric, rather than woven, to increase the softness and enhance the appearance of the fabric side of the product." As illustrations of the use of the product the inventor stated "automobile seat coverings foam rubber backed with finely knitted fabric presents a softer texture and a more pleasing appearance than can be obtained with a woven textile fabric. Also, foam rubber backed with knitted textile fabric such as tricot is desired in making certain products such as brassieres, because of the soft sheen and delicate appearance of the fabric."

For his means of accomplishing these surface objectives the inventor introduced between the layer of the sponge rubber and the knitted fabric "an intermediate layer of square mesh fabric which was substantially non-elastic." To put this product together he spread freshly foamed latex upon a smooth surface which traveled in one direction under a doctor roll or doctor bar which was adjusted to give the latex the desired depth or thickness. The two fabrics, the woven and the knitted, were then carried under the doctor bar so that the open mesh woven fabric was in direct contact with the top surface of the reduced layer of foam latex and the knitted fabric was introduced on top of the woven fabric. The specification stated that by this process "the foamed latex will pass or 'strike' through the open meshes (of the woven fabric) into contact with the inner surface of the knitted fabric layer which also absorbs some of the water in the latex to cause the latex to firmly embed itself in the interstices of the knitted fabric and become securely anchored to the fabric layer."

Plainly enough this discloses a product and a process where foam latex passed through a woven fabric and embedded itself in the interstices of the knitted fabric. It appears to us that the passing of heated sponge rubber through a woven fabric does not in itself anticipate a key locking device such as that of the patent in suit. In Alderfer the passing of the latex through the interstices is described, but it simply passes through and into interstices of knit fabric which is shown in the Alderfer drawings as being of substantial thickness as in all knit fabrics. There is no suggestion whatever of a bonding by key-lock as in the patent before us.[3]

In describing his product the inventor of plaintiff's device set forth how the key locking knobs were formed. When the uncured sponge rubber sheet comes from the rubber mill it is placed on a traveling mold and the net fabric is placed thereover. A web is placed over the fabric and another beneath the mold. This five-ply assembly is then moved slowly between heated platens, fixedly spaced without pressure. The heat causes the sponge rubber sheet to expand and since the rubber is held in intimate contact with the fabric, the expansion forces the rubber to enter the interstices and "swell around adjacent threads of said fabric to form headed knob-like projections that are somewhat larger in size than the areas of the fabric interstices."

We are of the opinion that on the evidence here the jury were justified in finding as a fact that the product

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[3]Nothing in Alderfer suggests that the inventor intended or appreciated any key-locking development from the passage of the latex through the woven fabric. "It is well settled that prior accidental production of the same thing, where character and function are not recognized, does not anticipate." McKee v. Graton & Knight Co., 4 cir., 87 F. 2d 262, 264, and cases there cited. Walker on Patents, Deller's Edition, §57.

thus produced had a novelty not anticipated by anything shown in Alderfer. Its verdict should not have been set aside.

One thing that confirms us in this view is that the portion of the patent office file received in evidence discloses that Alderfer was cited in connection with the application for plaintiff's patent and that this problem of anticipation by Alderfer was considered and a resolution of the matter arrived at only after considerable controversy and an amendment of the claims originally presented.[4]

As noted in S. H. Kress & Co. v. Aghnides, 4 Cir., 246 F. 2d 718, the usual presumption of validity of a patent (Mumm v. Decker & Sons, 301 U. S. 168, Patterson-Ballagh Corp. v. Moss, 9 Cir., 201 F. 2d 403, 406), may be strengthened by the history of the patent in the patent office, particularly when it has been granted only after considerable controversy.

This brings us to the question whether the new improvement disclosed in the patent in suit measures up to the established standards for invention. This is a question of law. Bergman v. Aluminum Lock Shingle

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[4]An original claim "6" was rejected, it being stated by the Examiner "In Alderfer the fabric 10 is considered to have the interstices through which the rubber extends and fastens itself as claimed." Claim 6 to which this referred read as follows: "In a carpet underlay comprising a coarse-mesh fabric and a sponge rubber facing thereon, a multiplicity of headed projections integral with the facing and extending from the facing through the interstices of the fabric with the heads thereof on the side of the fabric opposite to the facing." This claim was then amended to read as in Claim 3 of the patent. (footnote 1, supra.).

It will be noted that in the amended claim the product is described not merely as one involving projections through the fabric, but with one having "projections on the bulges" and extending through the interstices "to bond the bulges of the facing and the fabric." So amended the claim No. 3 was allowed.

Corp. of America, supra, which requires a discussion of whether the device here shown required more ingenuity than the work of a mechanic skilled in the art. Cuno Corp. v. Automatic Devices Corp., 314 U. S. 84, 90; Leishman v. General Motors Corp., 9 Cir., 191 F. 2d 522, 530; 35 U. S. C. §103.

The record here shows that leading up to the development of the product here in question was a long period of study, effort and experiment in an attempt to produce a practical means of attaching fabric to sponge rubber without the use of cement, which was the previously accepted method of attachment. The cementing process added approximately 10% to the cost of such a product. The device had commercial success; beginning with gross sales of $350,000 in 1951 they increased in three years to $2,370,000. All of these things, though not controlling, are indicia of actual invention and properly considered in determining that question. It is of no significance that "viewed after the event, the means . . . adopted seem simple and such as should have been obvious to those who worked in the field, but this is not enough to negative invention." Goodyear Co. v. Ray-O-Vac. Co., 321 U. S. 275, 279. "Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit." Carnegie Steel Co. v. Cambria Iron Co., 185 U. S. 403, 446. See Patterson-Ballach Corp. v. Moss, supra.

It is inferable from the facts in this case, including the rapid success which the new product found in the market, that this development for the first time, of a key-lock bond system for attaching the rubber to the

fabric, was not only highly useful and a significant improvement over former products which utilized cement for attachment, but that it measured up to the established standards required for invention.

The trial court, without dealing in any specific manner with the question of the development of a key-locking engagement between the fabric and sponge rubber so as to bond the same, complained that plaintiff's evidence too much emphasized the method and apparatus used in the construction of the project. It is true that the specifications include a description of the manner and process of making and using the invention; but the precise structure of the patent is also described with clarity and the drawings referred to in the specifications, particularly Figures 2 and 3, adequately disclose the nature of the claims. The addition to the specifications of a description of the manner in which the carpet underlay described may be made, merely adds to the other description but in no manner invalidates the patent.[5] Furthermore, the claims adequately and sufficiently covered and described the improvement regarded as the invention.[6]

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[6]In Winslow Engineering Co. v. Smith, 223 F. 2d 438, this court, following Graver Tank & Mfg. Co. v. Linde Air Products Co., 336 U.S. 271, although it found invention, held a patent invalid for insufficiency of the statements in the claims and that the deficiency could not be supplied by reference to the specifications. A similar point has not been raised in this case; but it is plain that the claims here are stated adequately to meet the requirements in the Graver Tank case, supra. Apparently in Bergman v. Aluminum Lock, supra, this court overlooked the rule of the Graver case and its own decision in the Winslow case.

[5]Trusell Mfg. Co. v. Wilson-Jones Co., 2d cir., 89 F. 2d 1027, 1029: "But, if the article is new, it may be patented, and the claim will not be invalidated merely because it describes the article with some reference to the method of producing it." See 35 U.S.C. §112.

We hold that the patent was valid.

With respect to the question of infringement, little need be said. A mere examination of the exhibits disclosing the patented article produced pursuant to plaintiff's patent and the accused device adequately demonstrates the claimed infringement. In setting aside the verdict the court below did not purport to find any fault with the jury's finding of infringement. It would be impossible to do so.

The judgment is reversed and the cause is remanded for further proceedings not inconsistent with this opinion

(Endorsed) Opinion Filed Feb. 8, 1961.

Frank H. Schmid, Clerk.

Judgment.

Office of the Clerk
U. S. Court of Appeals
P. O. Box 547
San Francisco 1, Calif.

March 21, 1961

Allan D. Mockabee, Esq. Attorney-at-law.
108 West 6th Street,
Los Angeles 14, Calif.

Dear Sir:

The Petition for a Rehearing heretofore filed in case No. 16562—Nat'l Sponge Cushion Co. v. Rubber Corporation of California, was this day denied.

Pursuant to Rule 26, and unless stayed by the order of the Court, a mandate of this Court under said Rule will be due to issue on the expiration of five (5) days from the date hereof.

Very Truly yours,

FRANK H. SCHMID, Clerk.

Memorandum Opinion.

United States Court of Appeals, for the Ninth Circuit.

National Sponge Cushion Co., Inc., Plaintiff-Appellant, v. Rubber Corporation of California, Defendant-Appellees. No. 16562.

Filed, Sept. 12, 1961.

Before Pope, Jertberg and Merrill, Circuit Judges.

Appellee's motion for an order that the trial court for the Southern District of California be permitted to decide on their merits Motions under Rules 59 and 60, Federal Rules of Civil Procedure, is denied.

Walter L. Pope,
Gilbert H. Jertberg,
Charles M. Merrill,
United States Circuit Judges

April 3, 1956 D. R. HARWIN ET AL 2,740,739

CARPET UNDERLAY

Filed Dec. 27, 1952

Fig. 1.

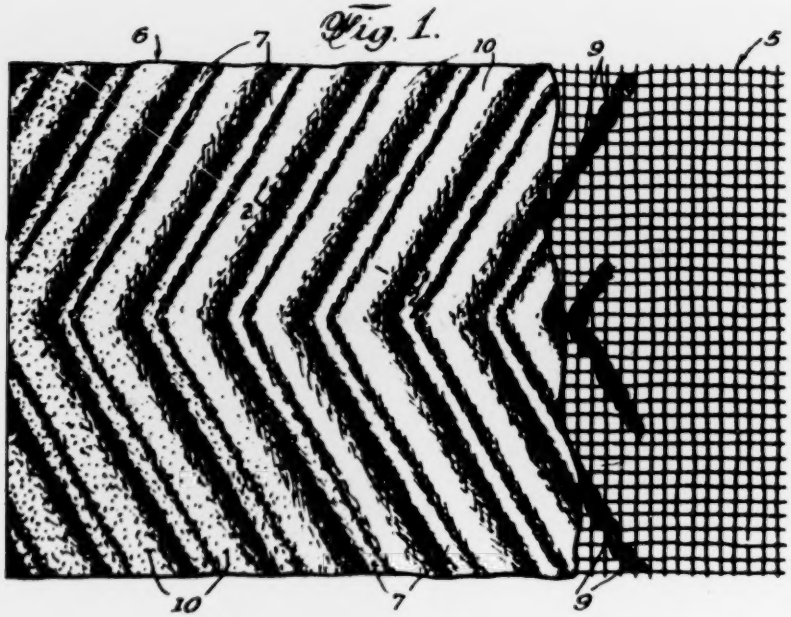

Fig. 2.

Fig. 4.

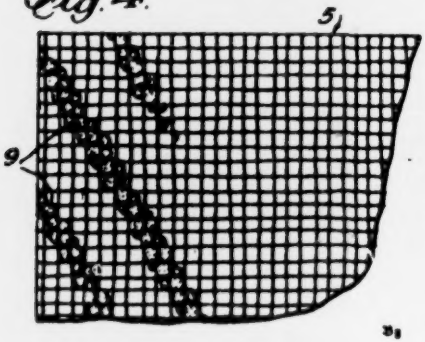

Fig. 3.

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United States Patent Office

2,740,739

Patented Apr. 3, 1956

2,740,739

CARPET UNDERLAY

Dixon R. Harwin, Alfred Stern, and Virgil H. Bodle, Los Angeles County, Calif., assignors to National Sponge Cushion Co., Inc., Los Angeles, Calif., a corporation of California

Application December 27, 1952, Serial No. 328,186

4 Claims. (Cl. 154—49)

This invention relates to a carpet underlay or pad and, while more particularly adapted for use as an underlay to cushion carpets and rugs, the same is also adapted to be used as upholstering material, in the production of mattresses, padding for various purposes, cushions, etc.

Prior types of carpet underlay include jute pads with or without rubber sprayed thereon, similar pads made of cattle hair or a combination of cattle hair and jute, flat sponge rubber pads with or without fabric, flat latex sponge rubber, waffle-type sponge rubber with pre-cemented fabric on one side, embossed rubber sheets in which resiliency is imparted by the embossments, etc. The effectiveness as carpet underlay of these prior materials varied, some having desirable properties as well as those not to be desired. For instance, the fibrous pads were subject to mildew and/or becoming moth eaten and also caused allergic discomfort to certain people; the flat sponge rubber pads, besides being quite expensive if formed of suitable thickness to be properly resilient, were too heavy and therefor difficult to handle, solid embossed rubber pads were also costly and heavy and, in addition, lacked porosity enabling drawing dust and dirt through them; etc.

Recognizing the different faults inherent in prior materials, it is an object of the present invention to provide carpet underlay that is shock-cushioning, long-wearing, comfortable in use, resists rug or carpet slippage, does not cause allergic reactions, eliminates damage by moths, mildew, etc., is easily handled, and, generally, is free of the different faults of prior underlay pads.

The present invention contemplates the provision of a carpet underlay comprised only of a large-mesh fabric backing and sponge rubber applied to and affixed to said fabric backing without adhesive, the rubber being so formed, during blowing and vulcanizing, that the same swells into a series of porous bulges and simultaneously effects key-locking engagement with the fabric by penetrating the interstices of the fabric to form knob-like heads larger than said interstices. It is another object of the invention to provide carpet underlay characterized by a key-locked connection of a fabric backing and sponge rubber substantially as defined above.

In order to improve the carpet-gripping properties of the underlay herein contemplated, it is a further object of the invention to form the sponge rubber bulges as a series of semi-tubular forms that are diagonally directed first in one direction and then in the other, alternately

A still further object of the invention is to provide a carpet underlay, as above indicated, in which the semi-tubular forms of sponge rubber extend at an angle to the warp and weft of the fabric backing, whereby the mentioned key-locking heads of said rubber are more evenly distributed over the length and width of the fabric so that every warp and weft thread of the fabric has several points of interlocking engagement with the sponge rubber.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawing merely shows and the following description merely describes one embodiment of the present invention which is given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

Fig. 1 is a top plan view of a relatively small portion of carpet underlay according to the present invention, a fragment of the sponge rubber thereof being removed to show, in cross-section, the interlock between said rubber and the fabric backing of the underlay.

Fig. 2 is a considerably enlarged fragmentary cross-sectional view as taken on line 2—2 of Fig. 1.

Fig. 3 is a further enlarged fragmentary cross-sectional detail view of a portion of Fig. 2 and particularly showing the interlocking feature of the underlay.

Fig. 4 is a fragmentary bottom plan view of the underlay showing the key-locking portions of the sponge rubber that penetrate the interstices of the fabric backing.

Referring now to the drawing, the present carpet pad or underlay comprises, generally, a fabric backing 5 and a top facing 6 of sponge rubber bonded to said backing in a manner and by means hereinafter described.

The fabric backing 5 is preferably in the form of a coarse-mesh material that may be termed net, since the interstices of the same are large relative to the thickness of the thread or yarn from which the fabric is woven. In the usual way, this net fabric has warp and weft threads that are, respectively, longitudinal and transverse to the length of the fabric to, thereby, eliminate longitudinal and transverse stretch of the fabric

The fabric threads may be jute or a comparable material which, in practice, are woven to provide a mesh having about fourteen threads per inch. The thread count may vary, providing the interstices of the fabric are large enough to permit ample penetration of the sponge rubber therethrough.

With regard to the sponge rubber used to form top facing 6, it is deemed unnecessary to detail all of the different ingredients contained therein when initially compounded. For the purposes of this invention, it can be stated that the uncured rubber is compounded from raw rubber as it comes from the bale (the same being first softened, as by heat or in other ways), a blowing agent, accelerators, softening anti-oxidant, filler and sulphur.

Ordinary sponge rubber is compounded with a blowing agent, such as soda bicarbonate or sodium carbonate, or other like blowing agents, activated with various acids, such as stearic, oleic or acetic acid, in such manner that, under heat, the blowing of the sponge will take place first and vulcanization later. In order to enable the gases generated by the vulcanizing and blowing heat to more fully expand and seal, the present invention contemplates simultaneous or substantially simultaneous blowing and vulcanization by providing an excess of accelerator over the amount commonly used, and also a considerably larger amount of sulphur than is commonly used. In the present instance, at least 2% and as much as 3% of accelerator and 3.75% to 4% of sulphur in the rubber compound are used under heat ranging between 300° and 370° F. to obtain substantially simultaneous blowing and vulcanization of the sponge rubber.

In practice, a combination of what is known in the trade as Captax, Altax, Ledate and Aktone comprises the accelerator, the urea in Aktone causing uniform cells or

pores in the sponge and also inducing slight vulcanization before blowing and full vulcanization occurs.

The crude rubber, compounded as above, is mixed in a Banbury machine to break the "nerve" of the crude rubber and obtain thorough homogeneity among the ingredients. The compound is then rolled out into a sheet about .050" thick in a conventional rubber mill. Of course, a coloring agent may be introduced in the compound if desired.

To form a carpet underlay according to the invention, the uncured sponge rubber sheet, as it comes from the rubber mill, is placed on a travelling mold and the net fabric 5 is placed thereover. A web is placed over the fabric and another beneath the mold. This five-ply assembly is then moved slowly between chests or platens heated to between 300° and 370° F. No pressure is applied, the heated platens being fixedly spaced.

The gases generated in the sponge rubber sheet cause expansion of said sheet to a thickness some ten times greater than the initial .050" thickness, except where the sheet is confined by the mold. At such points, indicated at 7, the rubber is held in intimate contact with fabric 5 and, in blowing or expanding, the rubber is forced to enter the interstices of the fabric, as best seen in Fig. 3, and swell around adjacent threads 8 of said fabric to form headed knob-like projections 9 that are somewhat larger in size than the areas of the fabric interstices. The web on that side limits such rising of the rubber so that the headed projections 9 are generally flattened, as shown. Thus, wherever the mold prevents expansion away from fabric 5, the rubber expands in the opposite direction through said fabric.

Between the points of engagement 7 of the rubber and the mold, as the rubber blows, the same expands into the mold cavities. Such expanding portions are shown at 10 and, in this instance, the same are in the form of semi-tubular portions that alternate with the points or areas 7. It is immaterial what the shape of the mold cavities is, providing the depth of the same is sufficient to accommodate the expanding rubber as it blows. The semi-tubular form shown is preferred because the same affords channels or passages 11 that permit free escape of the released gases. Also, because the semi-tubular forms can be arranged on a bias or diagonal to the weave of fabric 5, an efficient distribution of the projections 9 is afforded and the diagonal direction may be alternately changed to improve the carpet-gripping properties of the underlay.

Because of the porous nature of the sponge rubber and also because areas 7 are quite thin, the underlay thus produced can be kept clean by ordinary vacuum cleaners while such cleaners are vacuuming the rug or carpet overlaying the same.

While we have illustrated and described what we now contemplate to be the best mode of carrying out our invention, the construction is, of course, subject to modification without departing from the spirit and scope of the invention. It is, therefore, not desired to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described the invention, what we claim and desire to be secured by Letters Patent is:

1. A carpet underlay comprising a coarse-mesh fabric, and a sponge rubber facing on one side of said fabric and formed with bulges that are spaced from the fabric, said facing between the bulges, being in contact with the fabric and having a multiplicity of projections formed and forced by pressure from a blowing agent and extending into and through the interstices of the fabric.

2. A carpet underlay according to claim 1; the portions of said projections that extend through the interstices of the fabric being larger than said interstices to effect a key-locking engagement of the fabric and sponge rubber.

3. A carpet underlay comprising a coarse-mesh fabric, a sponge rubber facing on one side of said fabric and formed with bulges that are spaced from the fabric, said facing, between the bulges, being in contact with the fabric, a multiplicity of integral projections on the bulges and extending through the interstices of the fabric to bond the bulges of the facing and the fabric, the latter being generally flat.

4. In a carpet underlay according to claim 3; the projections being disposed along spaced parallel lines that are on a bias relative to the weave of the fabric.

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Aug. 30, 1949. G. W. BLAIR ET AL 2,480,316

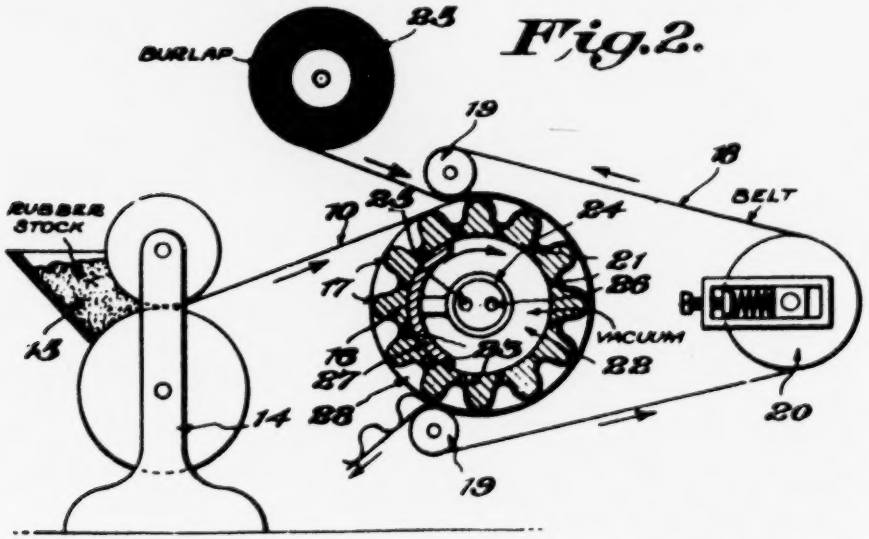
METHOD OF MAKING LAMINATED CUSHION MATERIAL

Original Filed Jan. 2, 1942

Fig. 1.

Fig. 3.

Fig. 2.



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Attorneys

Patented Aug. 30, 1949

2,480,316

UNITED STATES PATENT OFFICE

2,480,316

METHOD OF MAKING LAMINATED CUSHION MATERIAL

George W. Blair, Mishawaka, Ind., and Virgil H. Bodle, Los Angeles, Calif., assignors to Mishawaka Rubber and Woolen Manufacturing Company, Mishawaka, Ind., a corporation of Indiana

Continuation of application Serial No. 425,462, January 2, 1942. This application November 11, 1944, Serial No. 562,986

3 Claims. (Cl. 154—33.66)

1

This invention relates to elastically yieldable laminated flexible material, and an improved method of making such material, and this application is a continuation of our prior application, Serial No. 425,462, filed January 2, 1942, now abandoned.

While capable of many uses, the product of the present invention is particularly adapted as a carpet or rug underlay. In such adaptation, it provides a rug padding having desirable cushioning and anti-slip or non-skid properties.

It is an important object of the invention to produce a strong, durable and inexpensive material which will possess elastically yieldable characteristics in the direction of the depth or thickness of the material, thereby particularly adapting the material for use as a carpet or rug underlay.

The product of the present invention includes a thin sheet of rubber material shaped to provide hollow open sided embossments, and a backing sheet, such for instance as burlap, Osnaburg, or other inexpensive fabric, preferably of relatively open weave, applied and secured to one side of the rubber sheet and closing open sides of the embossments, thereby reinforcing the embossments and preventing collapse thereof under stress applied thereto and trapping atmospheric air in the embossments so as to provide the product with a plurality of air cells of material size such as will give cushioning or elastically yieldable characteristics to the product.

It is an important object of the invention to provide an improved method of and apparatus for producing the rubber lamination or sheet element and embossing the same in a continuous operation, and at the same time applying and securing the backing element thereto, whereby the complete material may be produced as a continuous operation and the composite material made in continuous sheets of any desired lengths in a simple and inexpensive manner.

The present invention permits of the use of inexpensive rubber stock such as may be calendered into thin rubber sheets of slight elastic characteristics, and it is an object of the present invention to provide for including such a sheet in a composite product which is elastically yieldable in the direction of its depth or thickness for the purpose of the present invention.

2

In the drawings:

Figure 1 is a sectional perspective view of the product of the present invention.

Figure 2 is a diagrammatic view in side elevation of an embodiment of an apparatus for carrying out the method of the present invention.

Figure 3 is an enlarged fragmentary detail of the embossment-forming drum.

The product of the present invention has been shown in Figure 1, wherein 10 designates a thin, more or less flimsy, sheet or lamination of rubber, bent, shaped or otherwise formed into convolutions, corrugations or hollow ribs 11, which in the present embodiment, are shown as extending transversely across the width of the sheet and constituting open sided embossments. Applied to one side of the rubber sheet is a backing sheet 12 of suitable material, such for instance as burlap, although other material may be employed as a backing to reinforce the more or less flimsy sheet of rubber material. The backing sheet 12 touches and is secured to the peaks or tops of the embossments or corrugations at one side of the rubber sheet as by a layer or coating 13 of cement, rubber or the like, or by being vulcanized directly thereto. This backing sheet bridges and closes the open sides of the embossments at one side of the rubber sheet and ties together the closed sides of successive embossments or corrugations on the same side of the sheet and thereby prevents collapse of the hollow embossments which have their open sides closed by the backing sheet 12. The backing sheet also reinforces the corrugated rubber sheet, and puts the composite sheet in proper condition for handling, as well as preventing collapse of the corrugated or embossed rubber sheet.

The present product is comparable to a sponge or cellular rubber sheet, and has the advantage that, while blowable cellular or sponge rubber may be used, nevertheless, inexpensive non-cellular rubber stock may be employed, for the reason that by corrugating or providing the rubber sheet with hollow open sided embossments and employing the backing sheet as shown, the composite sheet will have a plurality of air cells defined by the hollow corrugation. The corrugations are open to the atmosphere at opposite ends of the corrugations, and these small openings permit breathing so that the desired cushioning effect is obtained.

While in Figure 1, the composite product is shown with the backing sheet 12 on the underside of the rubber sheet 10, yet when employing the product as a rug or carpet underlay, the backing sheet 12 may be uppermost or on top whereby the backing sheet will present a rough coarse surface to the underside of a rug or carpet laid thereon and tend to prevent slipping of the rug or carpet edgewise, and thus the new product has advantageous non-slip characteristics.

An apparatus for producing the product of the invention has been shown diagrammatically in Figure 2, wherein 14 designates a suitable calender for continuously forming a batch of rubber stock 15 into the sheet 10 which is led from the calender around the periphery of a rotatable hollow drum 16 having spaced longitudinal ribs 17, by an endless belt 18 trained around suitable guide rolls 19 and 19' and also around a belt tensioning roll 20, the guide rolls 19 being positioned with respect to the drum 16 so as to cause a portion of the belt to partially embrace the periphery of the drum in close relation therewith to cause the rubber sheet 10 to hug a substantial extent of the periphery of the drum. The pressure of the belt 18 against the drum 16 may be regulated by adjustment of the tension roll 20. In the calendering operation the rubber is heated, and if supplied directly therefrom to the drum 16, as shown in the drawing, so that it is not appreciably cooled it is soft enough so that it will gravitate into the channels of the shaping drum 16. However, a suction pull may be added to that of gravity, as by the employment of radial openings 21 provided through the peripheral wall of the drum 16, preferably in the form of slots extending the length of the drum and preferably located between successive ribs 17 so as to constitute passages communicating between the interior chamber 22 of the hollow drum and the channels 23 between the ribs 17. The interior chamber 22 of the drum will be put in communication at one or both ends of the drum with an air exhaust or suction apparatus, not shown, so that the portion of the rubber strip which is partially embracing the drum in contact with the outer edges of the ribs 17 will be subjected to the pull of the exhaust or suction drum and thereby sucked or drawn into the channels 23, whereby the rubber sheet will be caused to take on the corrugated shape of the periphery of the drum, thus providing the sheet with the hollow ribs 11 constituting hollow embossments which are open throughout their outer sides. Preferably the drum 16 is provided, at either end, with an annular flange 28, or other appropriate means for closing the ends of the drum channels 23 in order to insure the effectiveness of the suction upon the rubber material.

If desired, the hollow shaping drum may also be heated, in any suitable manner, not shown, but preferably by the injection of steam into the interior chamber 22 of the drum, so as to vulcanize the rubber sheet during the shaping thereof and while the backing sheet is being applied thereto.

While any suitable manner of exhausting air from the chamber 22, and also of heating the drum 16 may be employed, we contemplate rotatably supporting each closed end of the drum on a fixed stub shaft 24, which may be provided with passages 26 and 26, communicating with the chamber 22, one for connection with an air exhaust or suction device and the other for connection with a source of steam for heating the drum. Other ways of heating the drum may be employed for softening the rubber so that it may readily conform to the corrugated periphery of the drum, and for vulcanization purposes where vulcanization is desired when the rubber sheet is on the drum. Also other ways of exhausting air from or providing a suction in the chamber 22 may be employed.

Ordinarily the rubber sheet will, by reason of its softened condition, gravitate into the channels 23 and remain there until stripped or led away from the drum by the pull of a winding drum or roll, not shown, employed for storing the completed product. However, suction may be employed, if desired, to assist in conforming the rubber sheet to the corrugations.

Any suitable means may be employed for closing such openings 21 as may not be covered by the rubber strip, as for instance a fixed closure member 27 supported from the fixed stub shafts on which the drum 16 rotates. However, it is not absolutely necessary to provide for closing such openings as only a slight pull on the rubber sheet in addition to that of gravity will suffice if gravitation in some instances is not altogether satisfactory. Also, we contemplate closing the opposite ends of the channels 23, as by means of an annular flange 29 at each end of the drum, if under some conditions it should become necessary or desirable in order to obtain the desired pull or suction on the rubber sheet passing around the drum.

The flexible backing sheet 12 of suitable textile or other strong and durable preferably open material, such as burlap, Osnaburg, or the like, is led, from a source of supply 29, between the portions of the rubber sheet 10 and the belt 18, which partially embrace the drum 16, so that the burlap will be carried along with the rubber sheet or strip in contact with the outer closed sides of the ribs 11 of the rubber sheet until the corrugated rubber sheet and the backing sheet thereon are discharged from the apparatus at the point where the guide roll 19' leads the endless belt 18 away from the drum. It will here be explained that the rubber sheet portion which is being led around the embossment-forming or shaping drum is sufficiently soft to conform to the shape of the periphery of the drum under the suction action.

The backing sheet being relatively porous and inelastic, will not be sucked into the corrugations of the drum but will remain in its original condition and will lie against the outer closed sides of the corrugations or embossments of the rubber sheet to which the backing sheet will be connected, as by the employment of a suitable cement or rubber coating 13 applied to either or both of the sheets preparatory to being passed around the forming or shaping drum.

Each or any selected rotating or moving element of the apparatus may be driven according to the character and condition of materials employed and the conditions under which the apparatus may be operating.

Vulcanization need not necessarily be accomplished during the laminating and forming operations on the drum 16, as the important consideration is the embossing of the rubber sheet and the assembly therewith of the backing sheet. If vulcanization does not occur, or is only partially attained, by the heat of the drum, then the laminated sheet leaving the same may be subjected to further heat treatment in a suitable apparatus, such as a belt conveyor or festoon vul-

canizer, for the purpose of producing or completing vulcanization. However, the employment of a heated hollow shaping drum lends itself admirably to the heating step of vulcanization simultaneously with the shaping of the rubber sheet.

While the calendering of a batch of rubber stock followed immediately by the embossing step and the assembly of the embossed sheet and the backing sheet is desirable and important, it will of course be understood that a preformed rubber sheet may be fed to the shaping drum from a suitable source of supply, such as a roll of a continuous strip of rubber, and heated by the heating drum sufficiently to soften the rubber sheet or strip so that it will conform to the configuration of the periphery of the drum.

Wherever in the specification and claims the term "rubber" or "rubber-like material" is used the same is intended to include natural rubber compounds and any similar natural or synthetic thermoplastic vulcanizable substances.

It is an important feature of the present invention that in the shaping of the rubber sheet in the corrugated form no companion corrugating roll or drum is employed, this being important as the soft, heated unvulcanized rubber is likely to stick thereto and interfere with the proper retention of the rubber sheet in the corrugations of the drum 16.

Thus as the heated soft sheet rubber is laid on the drum 16 it straddles the valleys between the adjoining corrugations thereof and solely by gravity, assisted by suction if necessary, the straddling rubber is distended and sinks into the valley and thereby conforms to the corrugated form of the surface of the drum 16, in which position it is maintained until vulcanized and removed from the drum. By this method no companion corrugation roll is required, the rubber being given the corrugated shape by application of shape defining means to only one side of the rubber sheet and any disturbance or displacement of the rubber after it is shaped to the corrugated form of the drum surface is thereby avoided. Accordingly the valley straddling portions of the rubber sheet are pulled down into the valleys as distinguished from pushing thereof into the valleys by a mating corrugated roll.

The hollow ribs or corrugations 11 of this composite sheet may if desired contain a filler which is held therein by the backing sheet 12. Such filler may be of ground sponge rubber, sawdust or the like.

While we have described our invention in a preferred form, we are aware that various changes and modifications may be made without departing from the principles of our invention, the scope of which is to be determined by the appended claims.

What we claim is:

1. The method of making laminated cushion material of the class described, which said method comprises calendering a sheet of vulcanizable plastic material, then heat softening the sheet progressively lengthwise and pulling successive heat softened portions thereof consecutively sidewise and thereby forming successive corrugations, then continuously advancing a backing sheet conjointly with the corrugated vulcanizable plastic sheet along a predetermined path in contacting side by side relation and, throughout a substantial length of said path, constantly compressing said backing sheet against crown portions of a series of the corrugations and simultaneously subjecting said crown portions to vulcanizing temperature and thereby vulcanizing said crown portions to the backing sheet.

2. The method of making laminated cushion material of the class described, which said method comprises calendering a sheet of vulcanizable plastic material, then heat softening the sheet progressively lengthwise and pulling successive heat softened portions thereof consecutively sidewise and thereby forming successive corrugations, then continuously advancing a backing sheet conjointly with the corrugated vulcanizable plastic sheet along a semi-circular path in contacting side by side relation and, throughout said path, constantly compressing said backing sheet against crown portions of a series of the corrugations and simultaneously subjecting said crown portions to vulcanizing temperature and thereby vulcanizing said crown portions to the backing sheet.

3. The method of making laminated cushion material of the class described, which said method comprises calendering and thereby heating a sheet of vulcanizable plastic material, then, before dissipation of any appreciable heat of calendering, further heating and softening the sheet progressively lengthwise and pulling successive heat softened portions thereof consecutively sidewise and thereby forming successive corrugations, then continuously advancing a backing sheet conjointly with the corrugated vulcanizable plastic sheet along a predetermined path in contacting side by side relation and, throughout a substantial length of said path, constantly compressing said backing sheet against crown portions of a series of the corrugations and simultaneously subjecting said crown portions to vulcanizing temperature and thereby vulcanizing said crown portions to the backing sheet.

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